

## **Appendix D**

### **1999 Drought Summary**

DROUGHT SUMMARY AS OF SEPTEMBER 14, 1999

TOTAL NUMBER IN RATION PHASE: 0  
TOTAL NUMBER IN CRITICAL PHASE 1  
TOTAL NUMBER IN ALERT PHASE 36  
TOTAL NUMBER IN ADVISORY PHASE 77

Totals:  
Conservation Phase – Advisory/Alert/Critical

River Basin	Source/Both Quality/Quantity	Infrastructure	Proactive Mgmt.
Cumberland	8	2	
Big Sandy	3	1	1
Green	8	8	1
Kentucky	14	21	6
Licking	7	18	
Tygarts Creek	1	0	
Ohio	2	6	
Little Sandy	0	1	
Salt	0	6	

Summary

PHASE	RIVER_BASIN	COUNTY_NAME	SYSTEM_NAME	PROBLE	POP_SERVED
Critical	05 Licking	BATH	Owingsville Water Works	Source	2,080
Alert	03 Green	HARDIN	Elizabethtown Municipal Water Works Plant A	Both	19,378
		LOGAN			

**Local Water Shortage Response Phases**  
(Each phase is a local option regarding what to include)

**ADVISORY:** Request voluntary conservation with public information & preparation for further action.

**ALERT:** Continue request for voluntary conservation & ban all Class 3 (non-essential) uses. Examples: fountains, watering lawns & golf courses, washing sidewalks & buildings, etc. Continue public information and enforce ban.

**CRITICAL (EMERGENCY):** Ban all Class 3 & Class 2 (socially or economically important) uses. Examples: commercial car washes, laundromats, restaurants, agricultural irrigation, schools, churches, motels, etc. Monitor use & enforce ban. Enact conservation pricing (use more – pay more). Continue public information.

**RATIONING:** Begin mandatory allocation of water to sustain Class 1 (essential) use. Examples: sustain human life & pets, maintain minimum standards of hygiene & sanitation, patient care, firefighting, etc. Monitor use & enforce ban. Continue information & conservation pricing.

*Triggers for the Local Response Phases:*  
Advisory: conditions indicate the potential for serious water supply shortages. From streams, demand = 20 –40% of flow. From reservoirs, 45-60 days supply left.  
Alert: visible or measurable signs that supplies are significantly lower than the seasonal norm and are diminishing. From streams, demand = 40-65% of flow. From reservoirs, 21-45 days supply left.  
Critical (Emergency): the water utility is experiencing a shortage. From streams, demand = 65-75% of flow. From reservoirs, 14-21 days supply left.  
Rationing: the supply is clearly inadequate to meet projected demands. Only applicable in a metered system. From streams, demand is 75% of flow or greater. From reservoirs, less than 14 days supply left.

04 Kentucky

ANDERSON	East Logan Water District	Infrastructure	5,437
	North Logan Water District	Infrastructure	1,404
	Russellville Municipal Water	Infrastructure	8,060
	Alton Water District	Infrastructure	1,703
	Lawrenceburg Municipal Water Works	Source	8,367
	South Anderson Water District	Infrastructure	3,266
	Manchester Water Works	Source	7,280
	North Manchester Water	Infrastructure	4,051
	Blue Grass Station	Infrastructure	73
	Kentucky American Water Company	Both	212,468
JESSAMINE	South Elkhorn Water District	Infrastructure	3,338
	Hindman Municipal Water Dept	Both	463
OWEN	Owenton Water Works	Source	2,467
	Tri-Village Water District	Infrastructure	2,857
SCOTT	Georgetown Municipal Water Service	Source	18,317
	Midway Municipal Water Works	Infrastructure	1,474
WOODFORD	North East Woodford Water District	Infrastructure	2,280
	South Woodford Water District	Infrastructure	2,644
	Versailles Municipal Water	Both	12,545

05 Licking

BATH			
	Bath County Water District	Infrastructure	4,810

Advisory

08 Ohio/Mainstem

01 Big Sandy

BOURBON  HARRISON   MONTGOMERY      NICHOLAS  PENDLETON     OLDHAM    FLOYD    LETCHER	Sharpsburg Water District	Infrastructure	2,535
	North Middletown Utilities	Infrastructure	998
	Cynthiana Municipal Water Works	Source	7,020
	Harrison County Water Association	Infrastructure	10,223
	Jeffersonville Water System	Infrastructure	3,388
	Judy Water Association	Infrastructure	2,379
	Levee Road Water Association	Infrastructure	1,724
	Montgomery County Water District #1	Infrastructure	1,440
	Mt. Sterling Water & Sewer System	Source	10,902
	Reid Village Water Association	Infrastructure	2,327
	Nicholas County Water District	Infrastructure	1,373
	Butler Municipal Water	Source	858
	East Pendleton County Water District	Infrastructure	1,893
	Pendleton County Water District South	Infrastructure	1,256
	Goshen Utilities	Infrastructure	3,237
	Beaver Elkhorn Water District	Both	5,200
	Wheelwright Utilities Commission	Source	1,001
	Jenkins Water Works	Infrastructure	2,600

02 Cumberland

MARTIN	Martin County Water District #1	Source	8,050
PIKE	Mountain Water District	Infrastructure	18,720
BELL	Henderson Settlement	Source	65
CHRISTIAN	Oak Grove Water District	Source	5,192
HARLAN	Black Mountain Utility District/Luellen	Source	351
	Cumberland Water Works	Source	2,982
	Evarts Municipal Water Works	Source	1,708
	Gilley Hollow Water System	Infrastructure	47
	Green Hills Water District	Source	572
	Lynch Water Plant	Source	1,326

03 Green

LOGAN	Adairville Municipal Water System	Source	1,313
	South Logan Water System	Infrastructure	4,894
BUTLER	Morgantown Water System	Infrastructure	2,454
EDMONSON	Brownsville Water System	Infrastructure	1,235
	Edmonson County Water District	Both	9,685
GRAYSON	Caneyville Water System	Source	1,747
HARDIN	Hardin County Water District # 1	Source	23,400
	Hardin County Water District #2	Source	27,167
LARUE			

04 Kentucky

LOGAN	Hodgenville Water Works	Infrastructure	3,471
	LaRue County Water District #1	Infrastructure	5,590
OHIO	Auburn Water Works	Source	1,612
TODD	Fordsville Water Works	Source	967
WARREN	Todd County Water District (Plants A & B)	Source	8,874
BREATHITT	Bowling Green Municipal Water	Source	39,728
	Warren County Water District	Infrastructure	44,372
GARRARD	Jackson Municipal Water Works	Source	5,460
	Rousseau Elementary School	Source	200
GRANT	Garrard County Water Association Inc	Infrastructure	9,435
	Lancaster Municipal Water Works	Source	4,368
JESSAMINE	Bullock Pen Water District	Infrastructure	8,320
LETCHER	Jessamine County Water District #1	Infrastructure	1,820
	Nicholasville Water Works	Source	14,248
	Spears Water Company	Infrastructure	5,806
	Wilmore Utilities System	Infrastructure	3,598
MADISON	Fleming-Neon Water System	Source	1,973
	Whitesburg Municipal Water Works	Source	1,768
	Berea College Water Utility	Source	11,000
	Kingston-Terrill Water District	Infrastructure	4,391

05 Licking

MERCER	Kirksville Water Association	Infrastructure	3,006
	Richmond Utilities Board	Source	22,082
	Waco Water District	Infrastructure	4,940
	White Hall Water District	Infrastructure	5,338
POWELL	Burgin Water Department	Infrastructure	1,222
	Harrodsburg Municipal Water Works	Infrastructure	8,580
	North Mercer Water District	Infrastructure	7,205
WOLFE	Beech Fork Water Commission	Source	8
	Clay City Water Plant	Infrastructure	1,648
	Powell Valley Water District	Infrastructure	2,714
	Stanton Water Works	Infrastructure	5,314
FLEMING	Campton Water Works	Source	2,556
	Fleming County Water Association	Infrastructure	6,253
	Magoffin County Water District	Infrastructure	3,045
	Salyersville Municipal Water	Both	2,246
NICHOLAS	Frenchburg Water Company	Infrastructure	3,900
	Carlisle Water Department	Both	3,071
ROBERTSON	Falmouth Water Department	Source	3,900
	Mt. Olivet Water System	Infrastructure	668
ROWAN	Morehead Utility Plant Board	Infrastructure	7,540

06 Little Sandy

	Rowan Water Inc.	Infrastructure	10,676
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08 Ohio/Mainstem

CARTER	Grayson Utility Commission	Infrastructure	7,771
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BRACKEN	Bracken County Water District	Infrastructure	3,211
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CAMPBELL	Northern Kentucky Water Service	Infrastructure	91,000
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GALLATIN	Gallatin County Water District	Infrastructure	2,288
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MEADE	Brandenburg Water Works	Source	2,587
	Doe Valley Utilities, Inc.	Both	1,287
	Meade County Water District	Infrastructure	2,621

TRIMBLE	Trimble County Water District #1	Infrastructure	2,662
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11 Tygarts Creek

CARTER	Olive Hill Municipal Water Works	Source	6,222
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12 Salt

BULLITT	Kentucky Turnpike Water District 1	Infrastructure	7,800
	Kentucky Turnpike Water District 2	Infrastructure	4,173
	Lebanon Junction Water Works	Infrastructure	2,280

NELSON	Bardstown Municipal Water Works	Infrastructure	14,882
	New Haven Water Department	Infrastructure	1,131

SHELBY	West Shelby Water District	Infrastructure	2,012
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Palmer Drought Index for September 14 indicates:		Legend for the Palmer Drought Index:	
Western Region (1):	-3.48	-1.00 = mild drought	
Central Region (2):	-4.06	-2.00 = moderate drought	
Bluegrass Region (3):	-4.39	-3.00 = severe drought	
Eastern Region (4):	-3.84	-4.00 = extreme drought	

Rainfall needed <u>above</u> normal:	
Western:	8.78 inches
Central:	10.56 inches
Bluegrass:	10.06 inches
Eastern:	6.97 inches

Shallow, perched local-flow aquifers show normal stress for this time of year. At present, most of the shallow aquifer springs are at very low flow or are dry. Most large, karst springs are presently exhibiting very low flow rates; approximately 15-20% below normal low flow for this time of year. The low flows are impacting public water supply systems depending on these springs for their water supply. Several public water supplies relying on large karst springs are in serious condition and this condition could become critical without significant precipitation. At least one system in a karst region, relying on surface water flow, has lost its source to groundwater infiltration. All water supply systems in the central, eastern, and Bluegrass regions of the state that rely on karst spring sources, or are vulnerable to karst capture of surface streams should be implementing water conservation and water-use restriction measures.

Shallow wells drilled into karst aquifers and fracture flow aquifers, as well as hand-dug wells, and abandoned mine sources are also considered vulnerable to water shortages. Small public water systems relying on wells and mines, including small communities, schools, and nursing homes, should be aware that they may experience water shortages and/or water quality problems. These systems should continue to check water levels in their wells or other sources to determine if water levels are below normal and whether it is likely that continued pumping will de-water the well(s) or source. Because it is very difficult to determine what amount of water will be available in shallow aquifers, these small public water supply systems should implement water conservation measures as a prudent action.

Many families, especially in eastern and central Kentucky, relying on shallow drilled wells and hand-dug wells are also experiencing water shortages. Approximately 7.5% of families in the central, Bluegrass and eastern regions of Kentucky (about 57,000 people) rely on shallow or hand-dug wells, many of which are experiencing water-shortage problems. There are also a great number public access springs (e.g. road-side springs) utilized by as many as 21,000 people in the central, Bluegrass, and eastern regions as a primary source of water. All of these springs are virtually dry or have very low flow. Thus, the families that rely on these springs, and families whose wells have gone dry are forced to haul water purchased from public water supplies to supplement or replace their water source; this increases the demand on public water supplies, many of which are experiencing water-shortage situations as well.

The aquifers of the Ohio River Alluvium, the Jackson Purchase, and deeper, confined aquifers throughout the state are exhibiting little or no significant impact from the drought.